THAT WHICH IS CLAIMED

1. A method for transporting a cytokine to a central nervous system of a mammal, comprising:

administering a composition comprising the cytokine to a tissue of the mammal innervated by the trigeminal nerve, the olfactory nerve, or a combination thereof, wherein the cytokine is absorbed through the tissue and transported to the central nervous system of the mammal.

2. The method of claim 1, wherein the tissue comprises a nasal cavity tissue, a conjunctiva, an oral tissue, or a skin.

3. The method of claim 2, wherein administering the cytokine to the conjunctiva comprises administering the cytokine between a lower eyelid and an eye.

4. The method of claim 2, wherein administering the cytokine to the skin comprises administering the cytokine to a face, a forehead, an upper eyelid, a lower eyelid, a dorsum of the nose, a side of the nose, an upper lip, a cheek, a chin, a scalp, or a combination thereof.

5. The method of claim 2, wherein administering the cytokine to the oral tissue comprises sublingual administration.

6. The method of claim 1, wherein said cytokine is selected from the group consisting of interferon-alpha (IFN-α), interferon-beta (IFN-β), interferon-gamma (IFN-γ), and biologically active variants thereof.

7. The method of claim 6, wherein the IFN-β is human IFN-β or a biologically active variant thereof.

8. The method of claim 7, wherein the IFN-β is biologically active and comprises an amino acid sequence having at least 70% sequence identity to human IFN-β.

9. The method of claim 1, wherein the cytokine is administered to an upper one third of a nasal cavity.

10. The method of claim 1, wherein the cytokine is transported to a cerebellum, a superior colliculus, a periventricular white matter, an optic nerve, a midbrain, a pons, an olfactory bulb, an anterior olfactory nucleus, or any combination thereof.

11. The method of claim 1, wherein the cytokine is transported to a spinal cord, a brain stem, a cortical structure, a subcortical structure, or any combination thereof.

12. The method of claim 1, wherein the cytokine is administered in a dosage range of about 0.14 nmol/kg of brain weight to about 138 nmol/kg of brain weight.

13. The method of claim 12, wherein the cytokine is human IFN-β or a biologically active variant thereof.

14. A method for administering a cytokine to a central nervous system of a mammal, comprising:

administering a composition comprising an effective amount of the cytokine to a tissue of the mammal innervated by the trigeminal nerve, the olfactory nerve, or a combination thereof, wherein the cytokine is absorbed through the tissue and transported into the central nervous system of the mammal in an amount effective to provide a diagnostic, protective, or therapeutic effect on a cell of the central nervous system.

15. The method of claim 14, wherein the tissue comprises a tissue of a nasal cavity, a conjunctiva, an oral tissue, or a skin.

16. The method of claim 15, wherein administering the cytokine to the conjunctiva comprises administering the cytokine between a lower eyelid and an eye.

17. The method of claim 15, wherein administering the cytokine to the skin comprises administering the cytokine to a face, a forehead, an upper eyelid, a lower eyelid, a dorsum of the nose, a side of the nose, an upper lip, a cheek, a chin, a scalp, or a combination thereof.

18. The method of claim 15, wherein administering the cytokine to the oral tissue comprises sublingual administration.

19. The method of claim 14, wherein the cytokine is transported to lymphatics associated with the central nervous system.

20. The method of claim 14, wherein said cytokine is selected from the group consisting of IFN-α, IFN-β, IFN-γ, and biologically active variants thereof.

21. The method of claim 20, wherein said IFN-β is human IFN-β or a biologically active variant thereof.

22. The method of claim 21, wherein said IFN-β or variant thereof retains biological activity and comprises an amino acid sequence having at least 70% sequence identity to the sequence of human IFN-β.

23. The method of claim 14, wherein the cytokine is delivered to an upper one third of a nasal cavity.

24. The method of claim 14, wherein the cytokine is transported to the central nervous system of the mammal in an amount effect for preventing or reducing a viral infection.

25. The method of claim 24, wherein said viral infection is selected from the group consisting of viral meningitis, herpes simplex, hepatitis C, and human immunodeficiency (HIV).

26. The method of claim 14, wherein the cytokine is transported to the central nervous system of the mammal in an amount effective to treat or prevent a disorder characterized by an immune or an inflammatory response.

27. The method of claim 26, wherein said disorder is selected from the group consisting of Alzheimer's disease, meningitis, Primary Sjogren's Syndrome, multiple sclerosis, and HIV.

28. The method of claim 14, wherein the cytokine is transported to the central nervous system of the mammal in an amount effective to treat or prevent a proliferative disorder.

29. The method of claim 28, wherein said proliferative disorder is a glioma.

30. The method of claim 14, wherein the cytokine is administered in a dosage range from about 0.14 nmol/kg of brain weight to about 138 nmol/kg of brain weight.

31. The method of claim 30, wherein the cytokine is human IFN-β or a biologically active variant thereof.

32. A method for transporting a cytokine to a lymphatic system of a mammal, comprising:

administering a composition comprising the cytokine to a tissue of the mammal innervated by the trigeminal nerve, the olfactory nerve, or a combination thereof, wherein the cytokine is absorbed through the tissue and transported to the lymphatic system of the

mammal.

33. The method of claim 32, wherein the tissue comprises a nasal cavity tissue, a conjunctiva, an oral tissue, or a skin.

34. The method of claim 33, wherein administering the cytokine to the conjunctiva comprises administering the cytokine between a lower eyelid and an eye.

35. The method of claim 33, wherein administering the cytokine to the skin comprises administering the cytokine to a face, a forehead, an upper eyelid, a lower eyelid, a dorsum of the nose, a side of the nose, an upper lip, a cheek, a chin, a scalp, or a combination thereof.

36. The method of claim 33, wherein administering the cytokine to the oral tissue comprises sublingual administration.

37. The method of claim 32, wherein said cytokine is selected from the group consisting of interferon-alpha (IFN-α), interferon-beta (IFN-β), interferon-gamma (IFN-γ), and biologically active variants thereof.

38. The method of claim 37, wherein the IFN-β is human IFN-β or a biologically active variant thereof.

39. The method of claim 38, wherein the IFN-β is biologically active and comprises an amino acid sequence having at least 70% sequence identity to human IFN-β.

40. The method of claim 32, wherein the cytokine is administered to an upper one third of a nasal cavity.

41. The method of claim 32, wherein the cytokine is transported to a deep cervical

node, a superficial cervical node, or a combination thereof.

42. The method of claim 32, wherein the cytokine is administered in a dosage range of about 0.14 nmol/kg of brain weight to about 138 nmol/kg of brain weight.

43. The method of claim 42, wherein the cytokine is human IFN-β or a biologically active variant thereof.

44. A method for administering a cytokine to a lymphatic system of a mammal, comprising:

administering a composition comprising an effective amount of the cytokine to a tissue of the mammal innervated by the trigeminal nerve, the olfactory nerve, or a combination thereof, wherein the cytokine is absorbed through the tissue and transported into the lymphatic system of the mammal in an amount effective to modulate an immune or inflammatory response.

45. The method of claim 44, wherein the tissue comprises a tissue of a nasal cavity, a conjunctiva, an oral tissue, or a skin.

46. The method of claim 45, wherein administering the cytokine to the conjunctiva comprises administering the cytokine between a lower eyelid and an eye.

47. The method of claim 45, wherein administering the cytokine to the skin comprises administering the cytokine to a face, a forehead, an upper eyelid, a lower eyelid, a dorsum of the nose, a side of the nose, an upper lip, a cheek, a chin, a scalp, or a combination thereof.

48. The method of claim 45, wherein administering the cytokine to the oral tissue comprises sublingual administration.

49. The method of claim 44, wherein said cytokine is selected from the group consisting of IFN-α, IFN-β, IFN-γ, and biologically active variants thereof.

50. The method of claim 49, wherein said IFN-β is human IFN-β or a biologically active variant thereof.

51. The method of claim 50, wherein said IFN-β or variant thereof retains biological activity and comprises an amino acid sequence having at least 70% sequence identity to the sequence of human IFN-β.

52. The method of claim 44, wherein the cytokine is delivered to an upper one third of a nasal cavity.

53. The method of claim 44, wherein the cytokine is administered in a dosage range of about 0.14 nmol/kg of brain weight to about 138 nmol/kg of brain weight.

54. The method of claim 53, wherein the cytokine is human IFN-β or a biologically active variant thereof.

55. The method of claim 44, wherein the cytokine is transported to the lymphatic system of the mammal in an amount effect for preventing or reducing a viral infection.

56. The method of claim 55, wherein said viral infection is selected from the group consisting of viral meningitis, herpes simplex, hepatitis C, and human immunodeficiency (HIV).

57. The method of claim 44, wherein the cytokine is transported to the lymphatic system of the mammal in an amount effective to treat or prevent a disorder characterized by an immune or an inflammatory response.

58. The method of claim 57, wherein said disorder is selected from the group consisting of Alzheimer's disease, meningitis, Primary Sjogren's Syndrome, multiple sclerosis, and HIV.

59. The method of claim 44, wherein the cytokine is transported to the lymphatic system of the mammal in an amount effective to treat or prevent a proliferative disorder.

60. The method of claim 59, wherein said proliferative disorder is a glioma.